

## Sequence Listing

<110> Botstein,David  
Desnoyers,Luc  
Ferrara,Napoleone  
Fong,Sherman  
Gao,Wei-Qiang  
Goddard,Audrey  
Gurney,Austin L.  
Pan,James  
Roy,Margaret Ann  
Stewart,Timothy A.  
Tumas,Daniel  
Watanabe,Colin K.  
Wood,William I.

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Acids Encoding the Same

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 Lys Ile Tyr Asn Pro Ser Glu Gln Cys Cys Tyr Asp Asp Ala Ile  
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 65 70 75  
 Trp Pro Cys Phe Glu Leu Cys Cys Pro Glu Ser Phe Gly Pro Gln  
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Glu Leu Gly Arg Pro Ala Arg Asp Glu Gly Gly Ser Gly Arg Asp  
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Trp Lys Ser Lys Ser Gly Arg Gly Leu Ala Gly Arg Glu Pro Trp  
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Ser Lys Leu Lys Gln Ala Trp Val Ser Gln Gly Gly Gly Ala Lys  
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Ala Gly Asp Leu Gln Val Arg Pro Arg Gly Asp Thr Pro Gln Ala  
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Thr Glu Glu Gly Pro Leu Cys Ala Gln Pro Glu Cys Pro Arg Leu  
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His Pro Arg Cys Ile His Val Asp Thr Ser Gln Cys Cys Pro Gln  
200 205 210

Cys Lys Glu Arg Lys Asn Tyr Cys Glu Phe Arg Gly Lys Thr Tyr  
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Gln Thr Leu Glu Glu Phe Val Val Ser Pro Cys Glu Arg Cys Arg

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Gln Thr Glu Cys Val Asp Pro Val Tyr Glu Pro Asp Gln Cys Cys		
260	265	270
Pro Ile Cys Lys Asn Gly Pro Asn Cys Phe Ala Glu Thr Ala Val		
275	280	285
Ile Pro Ala Gly Arg Glu Val Lys Thr Asp Glu Cys Thr Ile Cys		
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 <212> DNA  
 <213> Homo sapiens

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Asn Thr Ser Cys Asp Ser Gly Leu Gly Cys Gln Asp Thr Leu Met  
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Cys Thr Glu Ala Lys Asp Gln Glu Pro Arg Val Thr Glu His Arg  
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Met Gly Pro Gly Leu Ser Leu Ile Ser Tyr Thr Phe Val Cys Arg  
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Cys Pro Lys Gly Thr Thr His Cys Tyr Asp Gly Leu Leu Arg Leu  
155 160 165  
Arg Gly Gly Gly Ile Phe Ser Asn Leu Arg Val Gln Gly Cys Met  
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Pro Val Gly Met Thr Glu Asn Cys Asn Arg Lys Asp Phe Leu Thr  
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210> 17
211> 2387
212> DNA
213> Homo sapiens

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<211> 487

<212> PRT

<213> Homo sapiens

<400> 18

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Ser	Leu	Leu	Glu	Pro	Arg	Asp	Pro	Val	Ala	Ser	Ser	Leu	Ser	Pro
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Tyr	Phe	Gly	Thr	Lys	Thr	Arg	Tyr	Glu	Asp	Val	Asn	Pro	Val	Leu
			50						55					60
Leu	Ser	Gly	Pro	Glu	Ala	Pro	Trp	Arg	Asp	Pro	Glu	Leu	Leu	Glu
			65						70					75
Gly	Thr	Cys	Thr	Pro	Val	Gln	Leu	Val	Ala	Leu	Ile	Arg	His	Gly
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Thr	Arg	Tyr	Pro	Thr	Val	Lys	Gln	Ile	Arg	Lys	Leu	Arg	Gln	Leu
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His	Gly	Leu	Leu	Gln	Ala	Arg	Gly	Ser	Arg	Asp	Gly	Gly	Ala	Ser

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 Ser Thr Gly Ser Arg Asp Leu Gly Ala Ala Leu Ala Asp Trp Pro  
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 Pro Ala Leu Phe Ser Arg Glu Asn Tyr Gly Arg Leu Arg Leu Ile  
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 Thr Ser Ser Lys His Arg Cys Met Asp Ser Ser Ala Ala Phe Leu  
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 Val Ala Asp Met Glu Phe Gly Pro Pro Thr Val Asn Asp Lys Leu  
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 Met Arg Phe Phe Asp His Cys Glu Lys Phe Leu Thr Glu Val Glu  
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 Pro Glu Met Gln Asn Ile Leu Lys Lys Val Ala Ala Thr Leu Gln  
 260 265 270  
 Val Pro Val Asn Asp Leu Asn Ala Asp Leu Ile Gln Val Ala Phe  
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 Trp Cys Asp Val Phe Asp Ile Asp Asp Ala Lys Val Leu Glu Tyr  
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 Leu Asn Asp Leu Lys Gln Tyr Trp Lys Arg Gly Tyr Gly Tyr Thr  
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 Ile Asn Ser Arg Ser Ser Cys Thr Leu Phe Gln Asp Ile Phe Gln  
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 His Leu Asp Lys Ala Val Glu Gln Lys Gln Arg Ser Gln Pro Ile  
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 Ser Ser Pro Val Ile Leu Gln Phe Gly His Ala Glu Thr Leu Leu  
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 Pro Leu Leu Ser Leu Met Gly Tyr Phe Lys Asp Lys Glu Pro Leu  
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 Thr Ala Tyr Asn Tyr Lys Lys Gln Met His Arg Lys Phe Arg Ser  
 395 400 405

Gly	Leu	Ile	Val	Pro	Tyr	Ala	Ser	Asn	Leu	Ile	Phe	Val	Leu	Tyr
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His	Cys	Glu	Asn	Ala	Lys	Thr	Pro	Lys	Glu	Gln	Phe	Arg	Val	Gln
				425					430					435
Met	Leu	Leu	Asn	Glu	Lys	Val	Leu	Pro	Leu	Ala	Tyr	Ser	Gln	Glu
				440					445					450
Thr	Val	Ser	Phe	Tyr	Glu	Asp	Leu	Lys	Asn	His	Tyr	Lys	Asp	Ile
				455					460					465
Leu	Gln	Ser	Cys	Gln	Thr	Ser	Glu	Glu	Cys	Glu	Leu	Ala	Arg	Ala
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Asn	Ser	Thr	Ser	Asp	Glu	Leu								
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<210> 19  
 <211> 3554  
 <212> DNA  
 <213> Homo sapiens

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Ala	Val	Asn	Leu	Lys	Ser	Ser	Asn	Arg	Thr	Pro	Val	Val	Gln	Glu	35	40	45	
Phe	Glu	Ser	Val	Glu	Leu	Ser	Cys	Ile	Ile	Thr	Asp	Ser	Gln	Thr	50	55	60	
Ser	Asp	Pro	Arg	Ile	Glu	Trp	Lys	Lys	Ile	Gln	Asp	Glu	Gln	Thr	65	70	75	
Thr	Tyr	Val	Phe	Phe	Asp	Asn	Lys	Ile	Gln	Gly	Asp	Leu	Ala	Gly	80	85	90	
Arg	Ala	Glu	Ile	Leu	Gly	Lys	Thr	Ser	Leu	Lys	Ile	Trp	Asn	Val	95	100	105	
Thr	Arg	Arg	Asp	Ser	Ala	Leu	Tyr	Arg	Cys	Glu	Val	Val	Ala	Arg	110	115	120	
Asn	Asp	Arg	Lys	Glu	Ile	Asp	Glu	Ile	Val	Ile	Glu	Leu	Thr	Val	125	130	135	
Gln	Val	Lys	Pro	Val	Thr	Pro	Val	Cys	Arg	Val	Pro	Lys	Ala	Val	140	145	150	
Pro	Val	Gly	Lys	Met	Ala	Thr	Leu	His	Cys	Gln	Glu	Ser	Glu	Gly	155	160	165	
His	Pro	Arg	Pro	His	Tyr	Ser	Trp	Tyr	Arg	Asn	Asp	Val	Pro	Leu	170	175	180	
Pro	Thr	Asp	Ser	Arg	Ala	Asn	Pro	Arg	Phe	Arg	Asn	Ser	Ser	Phe	185	190	195	
His	Leu	Asn	Ser	Glu	Thr	Gly	Thr	Leu	Val	Phe	Thr	Ala	Val	His	200	205	210	
Lys	Asp	Asp	Ser	Gly	Gln	Tyr	Tyr	Cys	Ile	Ala	Ser	Asn	Asp	Ala	215	220	225	
Gly	Ser	Ala	Arg	Cys	Glu	Glu	Gln	Glu	Met	Glu	Val	Tyr	Asp	Leu	230	235	240	
Asn	Ile	Gly	Gly	Ile	Ile	Gly	Gly	Val	Leu	Val	Val	Leu	Ala	Val	245	250	255	
Leu	Ala	Leu	Ile	Thr	Leu	Gly	Ile	Cys	Cys	Ala	Tyr	Arg	Arg	Gly	260	265	270	
Tyr	Phe	Ile	Asn	Asn	Lys	Gln	Asp	Gly	Glu	Ser	Tyr	Lys	Asn	Pro	275	280	285	
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290

295

300

Asp Phe Arg His Lys Ser Ser Phe Val Ile  
305 310

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&lt;211&gt; 3437

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 21

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<212> PRT

<213> Homo sapiens

<400> 22

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			35						40					45
Asp	Thr	Ser	Glu	Glu	Ala	Leu	Leu	Leu	Pro	Asp	Trp	Leu	Lys	Leu
			50						55					60
Arg	Met	Ile	Arg	Ser	Glu	Val	Leu	Arg	Leu	Val	Asp	Ala	Ala	Leu
			65						70					75
Gln	Asp	Leu	Glu	Pro	Gln	Gln	Leu	Leu	Leu	Phe	Val	Gln	Ser	Phe
			80						85					90
Gly	Ile	Pro	Val	Ser	Ser	Met	Ser	Lys	Leu	Leu	Gln	Phe	Leu	Asp
			95						100					105

Gln	Ala	Val	Ala	His	Asp	Pro	Gln	Thr	Leu	Glu	Gln	Asn	Ile	Met	110	115	120
Asp	Lys	Asn	Tyr	Met	Ala	His	Leu	Val	Glu	Val	Gln	His	Glu	Arg	125	130	135
Gly	Ala	Ser	Gly	Gly	Gln	Thr	Phe	His	Ser	Leu	Leu	Thr	Ala	Ser	140	145	150
Leu	Pro	Pro	Arg	Arg	Asp	Ser	Thr	Glu	Ala	Pro	Lys	Pro	Lys	Ser	155	160	165
Ser	Pro	Glu	Gln	Pro	Ile	Gly	Gln	Gly	Arg	Ile	Arg	Val	Gly	Thr	170	175	180
Gln	Leu	Arg	Val	Leu	Gly	Pro	Glu	Asp	Asp	Leu	Ala	Gly	Met	Phe	185	190	195
Leu	Gln	Ile	Phe	Pro	Leu	Ser	Pro	Asp	Pro	Arg	Trp	Gln	Ser	Ser	200	205	210
Ser	Pro	Arg	Pro	Val	Ala	Leu	Ala	Leu	Gln	Gln	Ala	Leu	Gly	Gln	215	220	225
Glu	Leu	Ala	Arg	Val	Val	Gln	Gly	Ser	Pro	Glu	Val	Pro	Gly	Ile	230	235	240
Thr	Val	Arg	Val	Leu	Gln	Ala	Leu	Ala	Thr	Leu	Leu	Ser	Ser	Pro	245	250	255
His	Gly	Gly	Ala	Leu	Val	Met	Ser	Met	His	Arg	Ser	His	Phe	Leu	260	265	270
Ala	Cys	Pro	Leu	Leu	Arg	Gln	Leu	Cys	Gln	Tyr	Gln	Arg	Cys	Val	275	280	285
Pro	Gln	Asp	Thr	Gly	Phe	Ser	Ser	Leu	Phe	Leu	Lys	Val	Leu	Leu	290	295	300
Gln	Met	Leu	Gln	Trp	Leu	Asp	Ser	Pro	Gly	Val	Glu	Gly	Gly	Pro	305	310	315
Leu	Arg	Ala	Gln	Leu	Arg	Met	Leu	Ala	Ser	Gln	Ala	Ser	Ala	Gly	320	325	330
Arg	Arg	Leu	Ser	Asp	Val	Arg	Gly	Gly	Leu	Leu	Arg	Leu	Ala	Glu	335	340	345
Ala	Leu	Ala	Phe	Arg	Gln	Asp	Leu	Glu	Val	Val	Ser	Ser	Thr	Val	350	355	360
Arg	Ala	Val	Ile	Ala	Thr	Leu	Arg	Ser	Gly	Glu	Gln	Cys	Ser	Val	365	370	375
Glu	Pro	Asp	Leu	Ile	Ser	Lys	Val	Leu	Gln	Gly	Leu	Ile	Glu	Val	380	385	390
Arg	Ser	Pro	His	Leu	Glu	Glu	Leu	Leu	Thr	Ala	Phe	Phe	Ser	Ala			

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Ser Arg Ala Leu Glu Asn Arg Gly Ala Asp Ala Ser Met Ala Cys	695	700	705
Arg Lys Leu <sup>a</sup> Ala Val Ala His Pro Leu Leu Leu Arg His Leu	710	715	720
Pro Met Ile Ala Ala Leu Leu His Gly Arg Thr His Leu Asn Phe	725	730	735
Gln Glu Phe Arg Gln Gln Asn His Leu Ser Cys Phe Leu His Val	740	745	750
Leu Gly Leu Leu Glu Leu Leu Gln Pro His Val Phe Arg Ser Glu	755	760	765
His Gln Gly Ala Leu Trp Asp Cys Leu Leu Ser Phe Ile Arg Leu	770	775	780
Leu Leu Asn Tyr Arg Lys Ser Ser Arg His Leu Ala Ala Phe Ile	785	790	795
Asn Lys Phe Val Gln Phe Ile His Lys Tyr Ile Thr Tyr Asn Ala	800	805	810
Pro Ala Ala Ile Ser Phe Leu Gln Lys His Ala Asp Pro Leu His	815	820	825
Asp Leu Ser Phe Asp Asn Ser Asp Leu Val Met Leu Lys Ser Leu	830	835	840
Leu Ala Gly Leu Ser Leu Pro Ser Arg Asp Asp Arg Thr Asp Arg	845	850	855
Gly Leu Asp Glu Glu Gly Glu Glu Glu Ser Ser Ala Gly Ser Leu	860	865	870
Pro Leu Val Ser Val Ser Leu Phe Thr Pro Leu Thr Ala Ala Glu	875	880	885
Met Ala Pro Tyr Met Lys Arg Leu Ser Arg Gly Gln Thr Val Glu	890	895	900
Asp Leu Leu Glu Val Leu Ser Asp Ile Asp Glu Met Ser Arg Arg	905	910	915
Arg Pro Glu Ile Leu Ser Phe Phe Ser Thr Asn Leu Gln Arg Leu	920	925	930
Met Ser Ser Ala Glu Glu Cys Cys Arg Asn Leu Ala Phe Ser Leu	935	940	945
Ala Leu Arg Ser Met Gln Asn Ser Pro Ser Ile Ala Ala Ala Phe	950	955	960
Leu Pro Thr Phe Met Tyr Cys Leu Gly Ser Gln Asp Phe Glu Val	965	970	975
Val Gln Thr Ala Leu Arg Asn Leu Pro Glu Tyr Ala Leu Leu Cys			

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Gln Glu His Ala Ala Val Leu Leu His Arg Ala Phe Leu Val Gly  
 995 1000 1005

Met Tyr Gly Gln Met Asp Pro Ser Ala Gln Ile Ser Glu Ala Leu  
 1010 1015 1020

Arg Ile Leu His Met Glu Ala Val Met  
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&lt;210&gt; 23

&lt;211&gt; 2186

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 23

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 atgaggctcc gcaatggcac ctctctgacg ctgctgctct tctgcctgtg 100  
 cgccttcctc tcgctgtcct ggtacgcggc actcagcggc cagaaaggcg 150  
 acgttggtga cgtttaccag cgggagttcc tggcgctgcg cgatcggttg 200  
 cacgcagctg agcaggagag cctcaagcgc tccaaggagc tcaacctggt 250  
 gctggacgag atcaagaggg ccgtgtcaga aaggcaggcg ctgcgagacg 300  
 gagacggcaa tcgcacctgg ggccgcctaa cagaggaccc ccgattgaag 350  
 ccgtggaacg gctcacaccg gcacgtgctg cacctgccc cgtcttcca 400  
 tcacctgcca cacctgctgg ccaaggagag cagtctgcag ccgcgggtgc 450  
 gcgtgggcca gggccgcacc ggagtgtcgg tggatgatgg catcccagc 500  
 gtgcggcgcg aggtgcactc gtacctgact gacactctgc actcgtcat 550  
 ctccgagctg agccgcagg agaaggagga ctcggtcatc gtggtgctga 600  
 tcgccgagac tgactcacag tacacttcgg cagtgcaga gaacatcaag 650  
 gccttggtcc ccacggagat ccattctggg ctctggagg tcatctcacc 700  
 ctccccccac ttctaccctg acttctcccg cctccgagag tcctttgggg 750  
 accccaagga gagagtcagg tggaggacca aacagaacct cgattactgc 800  
 ttctcatga tgtacgcga gtccaaaggc atctactacg tgcagctgga 850  
 ggatgacatc gtggccaagc ccaactacct gagcaccatg aagaactttg 900  
 cactgcagca gccttcagag gactggatga tcctggagtt ctcccagctg 950  
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Gln Lys Gly Asp Val Val Asp Val Tyr Gln Arg Glu Phe Leu Ala	35	40	45
Leu Arg Asp Arg Leu His Ala Ala Glu Gln Glu Ser Leu Lys Arg	50	55	60
Ser Lys Glu Leu Asn Leu Val Leu Asp Glu Ile Lys Arg Ala Val	65	70	75
Ser Glu Arg Gln Ala Leu Arg Asp Gly Asp Gly Asn Arg Thr Trp	80	85	90
Gly Arg Leu Thr Glu Asp Pro Arg Leu Lys Pro Trp Asn Gly Ser	95	100	105
His Arg His Val Leu His Leu Pro Thr Val Phe His His Leu Pro	110	115	120
His Leu Leu Ala Lys Glu Ser Ser Leu Gln Pro Ala Val Arg Val	125	130	135
Gly Gln Gly Arg Thr Gly Val Ser Val Val Met Gly Ile Pro Ser	140	145	150
Val Arg Arg Glu Val His Ser Tyr Leu Thr Asp Thr Leu His Ser	155	160	165
Leu Ile Ser Glu Leu Ser Pro Gln Glu Lys Glu Asp Ser Val Ile	170	175	180
Val Val Leu Ile Ala Glu Thr Asp Ser Gln Tyr Thr Ser Ala Val	185	190	195
Thr Glu Asn Ile Lys Ala Leu Phe Pro Thr Glu Ile His Ser Gly	200	205	210
Leu Leu Glu Val Ile Ser Pro Ser Pro His Phe Tyr Pro Asp Phe	215	220	225
Ser Arg Leu Arg Glu Ser Phe Gly Asp Pro Lys Glu Arg Val Arg	230	235	240
Trp Arg Thr Lys Gln Asn Leu Asp Tyr Cys Phe Leu Met Met Tyr	245	250	255
Ala Gln Ser Lys Gly Ile Tyr Tyr Val Gln Leu Glu Asp Asp Ile	260	265	270
Val Ala Lys Pro Asn Tyr Leu Ser Thr Met Lys Asn Phe Ala Leu	275	280	285
Gln Gln Pro Ser Glu Asp Trp Met Ile Leu Glu Phe Ser Gln Leu	290	295	300
Gly Phe Ile Gly Lys Met Phe Lys Ser Leu Asp Leu Ser Leu Ile	305	310	315
Val Glu Phe Ile Leu Met Phe Tyr Arg Asp Lys Pro Ile Asp Trp			

320	325	330
Leu Leu Asp His Ile Leu Trp Val Lys	Val Cys Asn Pro Glu Lys	
335	340	345
Asp Ala Lys His Cys Asp Arg Gln Lys	Ala Asn Leu Arg Ile Arg	
350	355	360
Phe Lys Pro Ser Leu Phe Gln His Val	Gly Thr His Ser Ser Leu	
365	370	375
Ala Gly Lys Ile Gln Lys Leu Lys Asp	Lys Asp Phe Gly Lys Gln	
380	385	390
Ala Leu Arg Lys Glu His Val Asn Pro	Pro Ala Glu Val Ser Thr	
395	400	405
Ser Leu Lys Thr Tyr Gln His Phe Thr	Leu Glu Lys Ala Tyr Leu	
410	415	420
Arg Glu Asp Phe Phe Trp Ala Phe Thr	Pro Ala Ala Gly Asp Phe	
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Ile Arg Phe Arg Phe Phe Gln Pro Leu	Arg Leu Glu Arg Phe Phe	
440	445	450
Phe Arg Ser Gly Asn Ile Glu His Pro	Glu Asp Lys Leu Phe Asn	
455	460	465
Thr Ser Val Glu Val Leu Pro Phe Asp	Asn Pro Gln Ser Asp Lys	
470	475	480
Glu Ala Leu Gln Glu Gly Arg Thr Ala	Thr Leu Arg Tyr Pro Arg	
485	490	495
Ser Pro Asp Gly Tyr Leu Gln Ile Gly	Ser Phe Tyr Lys Gly Val	
500	505	510
Ala Glu Gly Glu Val Asp Pro Ala Phe	Gly Pro Leu Glu Ala Leu	
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